

## **Comparison of Arabidopsis Responses to *Alternaria brassicicola* and *Pseudomonas syringae* by Expression Profiling**

S. van Wees(1), S. Goregaoker(1), and J. Glazebrook(1,2)

(1)Torrey Mesa Research Institute, 3115 Merryfield Row, San Diego, CA 92121 (closed);

(2)Department of Plant Biology, University of Minnesota, 1445 Gortner Avenue, St. Paul, MN 55108

Biotrophic plant pathogens grow in living tissue, while necrotrophic pathogens first kill host tissue, and subsist on the remains. Plant resistance to biotrophic pathogens often involves gene-for-gene resistance and salicylic-acid (SA) mediated signaling. In contrast, gene-for-gene resistance relationships have not been identified for necrotrophic pathogens, and SA-dependent defense responses are generally ineffective. Rather, defense responses controlled by jasmonic acid (JA) and ethylene (ET) are effective in some cases. We have studied resistance to necrotrophs using the fungal pathogen *Alternaria brassicicola* strain MUCL20297, which is a poor pathogen of Arabidopsis, failing to cause disease symptoms on any accession tested. Jasmonic acid signaling and the Arabidopsis phytoalexin, camalexin, are required for resistance, but salicylic acid signaling is not required. In contrast, resistance to the bacterial pathogen *Pseudomonas syringae* requires salicylate signaling but not jasmonic acid signaling or camalexin. Plant responses to these two pathogens were compared by expression profiling using an Affymetrix array representing one-third of the Arabidopsis genome. Gene expression changes occurred within 12 hours after *Alternaria* treatment. Approximately 50% of *Alternaria*-induced genes were also induced by *P. syringae*. Reverse genetics analysis of *Alternaria*-induced genes led to discovery of a cytochrome P450 monooxygenase required for camalexin synthesis and resistance to *Alternaria*.